UNITED STATES NUCLEAR REGULATORY COMMISSION

ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (NRC) is issuing a new regulation to 10 CFR Part 50. The rule change adds a new section, § 50.69, which contains voluntary alternative requirements to certain existing requirements in 10 CFR Parts 21, 50 and Appendix A to Part 100.

ENVIRONMENTAL ASSESSMENT

Identification of the Action:

The action permits power reactor licensees and applicants for licenses to implement a voluntary alternative regulatory framework with respect to “special treatment” (i.e., those requirements beyond normal industrial practices that are imposed to provide added confidence that equipment is capable of meeting its functional requirements under design basis conditions.) These treatment requirements include additional design considerations, qualification, change control, documentation, reporting, maintenance, testing, surveillance, quality assurance, and the like. Under this framework, licensees (or applicants), using a risk-informed process for categorizing SSCs according to their safety significance, can remove SSCs of low safety significance from the scope of certain specified special treatment requirements. For SSCs of safety significance, existing requirements are retained, and the rule adds requirements that ensure SSC performance remains consistent with that assumed in the categorization process for beyond design basis conditions. The rule requirements establish a

process by which a licensee would categorize SSCs using a risk-informed process, adjust treatment requirements consistent with the relative significance of the SSC, and manage the process over the lifetime of the plant. To implement these requirements, a risk-informed categorization process is employed to determine the safety significance of SSCs and place the SSCs into one of four risk-informed safety class (RISC) categories. The determination of safety significance is to be performed by an integrated decision-making process which uses both risk insights and traditional engineering insights. The safety functions are to include both the design basis functions, as well as functions credited for severe accidents (including external events). Treatment requirements for the SSCs are applied as necessary to maintain functionality and reliability, and are a function of the category into which the SSC is categorized. Finally, assessment activities are to be conducted to make adjustments to the categorization and treatment processes as needed so that SSCs continue to meet applicable requirements. The rule also contains requirements for obtaining NRC approval of the categorization process and for maintaining plant records and reports.

The requirements that are being removed for SSCs categorized as low safety-significant (i.e., RISC-3 and RISC-4 SSCs) are those that involve special treatment (see list below from § 50.69(b)). Only the treatment requirements are being revised; functional requirements for these SSC will remain and the licensee are required to apply sufficient treatment to maintain functionality of these SSCs. RISC-3 and RISC-4 SSCs are removed from the scope of the following special treatment requirements listed in § 50.69:

(i) 10 CFR Part 21

(ii) The portion of 10 CFR 50.46a(b) that imposes requirements to conform to Appendix B to 10 CFR Part 50

(iii) 10 CFR 50.49

(iv) 10 CFR 50.55(e)

(v) The inservice testing requirements in 10 CFR 50.55a(f); the inservice inspection, and repair and replacement (with the exception of fracture toughness) requirements for ASME Class 2 and Class 3 SSCs in 10 CFR 50.55a(g); and the electrical component quality and qualification requirements in section 4.3 and 4.4 of IEEE 279, and sections 5.3 and 5.4 of IEEE 603-1991, as incorporated by reference in 10 CFR 50.55a(h)

(vi) 10 CFR 50.65, except for paragraph (a)(4)

(vii) 10 CFR 50.72

(viii) 10 CFR 50.73

(ix) Appendix B to 10 CFR Part 50

(x) The Type B and Type C leakage testing requirements in both Options A and B of Appendix J to 10 CFR Part 50, for penetrations and valves meeting the following criteria:

(A) Containment penetrations that are either 1-inch nominal size or less, or continuously pressurized.

(B) Containment isolation valves that meet one or more of the following criteria:

(*1*) The valve is required to be open under accident conditions to prevent or mitigate core damage events;

(*2*) The valve is normally closed and in a physically closed, water-filled system;

(*3*) The valve is in a physically closed system whose piping pressure rating exceeds the containment design pressure rating and that is not connected to the reactor coolant pressure boundary; or

(*4*) The valve is 1-inch nominal size or less.

(xi) Appendix A to Part 100, sections VI(a)(1) and VI(a)(2), to the extent that these regulations require qualification testing and specific engineering methods to demonstrate that SSCs are designed to withstand the Safe Shutdown Earthquake and Operating Basis Earthquake.

The Need for the Action:

The action is needed to implement the Commission's Policy Statement on the Use of Probabilistic Risk Assessment (PRA) on August 16,1995 (60 FR 42622), to increase the use of risk insights in all regulatory matters. This specific action pertains to special treatment requirements.

The current body of NRC regulations and their implementation are largely based on a "deterministic" approach. Requirements were devised on the basis of a defined and analyzed set of events as "design basis events." This approach has employed the use of safety margins, operating experience, accident analysis, and qualitative assessments of risk, as defense-in-depth philosophy. One element of this defense-in-depth approach is the imposition of special treatment requirements on structures, systems, and components (SSCs) that are important to safety to provide a reasonable assurance that such SSCs will continue to function during the postulated design basis conditions. Special treatment requirements are imposed on nuclear reactor applicants and licensees through a number of regulations that have been promulgated since the 1960's. These requirements specify different levels of special treatment requirements for equipment depending on the specific regulatory of concern. This regulatory framework provides reasonable assurance of adequate protection (no undue risk) to the health and safety of the public but in some cases also results in unnecessary regulatory burden.

The current scope of SSCs covered by the special treatment requirements governing commercial nuclear reactors is deterministically based and stems primarily from the evaluation of design basis events. However, advances in technology, coupled with operating reactor experience, have suggested that an alternative approach, one that maintains safety while reducing unnecessary regulatory burden, is possible and the utilization of such approach could increase regulatory effectiveness. The new approach embodied in the rule uses a risk-

informed process to evaluate the safety significance of SSCs and establish the appropriate level of special treatment requirements of SSCs. It is important to note that this rule is intended only to ensure that the scope of special treatment requirements imposed on SSCs is risk-informed. The rule, however, does not allow SSC functional requirements to be eliminated, or to allow equipment, that is required by the deterministic design basis, to be removed from the facility. Instead, by restructuring the regulations to allow an alternative risk-informed approach to special treatment, this rule enables licensees and the staff to focus their resources on SSCs that are significant contributors to plant safety. Conversely, for SSCs that do not significantly contribute to plant safety, this approach maintains SSC functionality, albeit at a reduced level of assurance.

The staff prepared a proposed rule package and provided it to the Commission in SECY-02-176. The Commission approved issuance of proposed 10 CFR 50.69 for public comment in a staff requirements memorandum (SRM) dated March 28, 2003. Consistent with Commission direction, the staff subsequently published proposed 10 CFR 50.69 for public comment in the *Federal Register* on May 16, 2003 (68 FR 26511). The Commission received 26 sets of comments in response to the proposed rule. The comments are discussed in section II of the final rule *Federal Register* notice.

Environmental Impacts of the Action:

This environmental assessment focuses on those aspects of § 50.69 where requirements are either reduced or eliminated, and where there is a resultant potential for an environmental impact.

The NRC has concluded that there will be no significant radiological environmental impacts associated with implementation of the rule requirements for the following reasons:

(1) Section 50.69 maintains the design basis functional requirements of the facility. For RISC-3 SSCs that have special treatment requirements removed, § 50.69 incorporates alternative treatment requirements in paragraph (d)(2) that maintain reasonable confidence in the capability of RISC-3 SSCs to perform their safety-related functions under design basis conditions throughout their service life. As a result, all the SSCs associated with limiting the releases of offsite radiological effluents will continue to be able to perform their functions, and as a result there would be no significant radiological effluent impact.

(2) The process and requirements established in § 50.69 do not extend to making changes to the design basis functional requirements of SSCs and this includes removal of SSCs from the facility. Any changes that affect any non-treatment aspects of an SSC (e.g., changes to the SSC design basis functional requirements) are still required to be evaluated in accordance with other regulatory requirements such as § 50.59.

(3) The rule is only enabling the special treatment requirements to be risk-informed. These requirements relate to the level of assurance that SSCs will perform their design basis functions, but all the associated SSCs are required to continue to function. Removal of special treatment requirements for low safety-significant SSCs may potentially result in changes to SSC reliability. Accordingly, the rule has provisions in § 50.69(c)(1)(iv) which require that there be "reasonable confidence that for SSCs categorized as RISC-3, sufficient safety margins are maintained and that any potential increases in core damage frequency (CDF) and large early release frequency (LERF) resulting from implementation of § 50.69(b)(1) and § 50.69(d)(2) are small." This implementation of this requirement provides reasonable confidence that reliability is maintained such that the risk associated with implementation of § 50.69 is small. This provides further assurance that SSCs important to limiting offsite radiological releases

perform their functions, and that there will be no significant radiological environmental impacts associated with implementation of the rule requirements.

(4) The standards and requirements applicable to radiological releases and effluents are not affected by this rulemaking and continue to apply to the SSCs affected by this rulemaking. The SSCs for which special treatment requirements are removed are located entirely within the restricted area (as defined in Part 20). Therefore implementation of the rule requirements would not result in off-site impacts due to normal operation.

(5) The rule contains feedback and process adjustment requirements in paragraph (e) that cause adjustments to be made, as necessary, to either the categorization or treatment processes to provide continued support for the assumptions of the categorization process and its results. These requirements, in conjunction with the corrective action requirements in § 50.69(d) for RISC-3 SSCs, ensure that SSCs associated with limiting the releases of offsite radiological effluents will continue to be able to perform their functions.

The NRC has concluded that as a result of this action there will be a beneficial impact on occupational exposure. Removal of special treatment requirements for RISC-3 and RISC-4 SSCs results in a reduction of activities associated with quality assurance, environmental qualification, monitoring, testing, and inspection. In many cases, the low safety-significant SSCs (for which the aforementioned activities are being reduced or eliminated) are located within radiological areas, and as a result, there would be a reduction in occupational exposures. The magnitude of this benefit has not been quantified, and will vary dependent on 1) the extent (i.e., how many systems) to which a licensee implements § 50.69, 2) the facility design, and 3) the vintage and licensing history of the facility (which determines how many special treatment requirements apply).

The action will not significantly increase the probability or consequences of accidents, nor result in changes being made in the types of any effluents that may be released off site, and there is no significant increase in occupational or public radiation exposure. The basis for this conclusion is that the rule requirements: 1) maintain the facility design basis functional requirements, 2) provide reasonable confidence that any change in risk associated with implementation is small, 3) do not allow that SSCs be removed from the facility (unless the appropriate and applicable change control requirements are satisfied), and 4) do not otherwise impact station operation (i.e., no changes to the types of radiological and nonradiological effluents or quantity of effluents). Therefore, there are no significant radiological environmental impacts associated with the action.

With regard to potential nonradiological impacts, implementation of the rule requirements has no other impact on the facility than to revise the treatment applied to SSCs, and specifically will not involve any historic sites. It does not affect nonradiological plant effluents and has no other environmental impact. Therefore, there are no significant nonradiological environmental impacts associated with the action.

Accordingly, the NRC staff concludes that there are no significant environmental impacts associated with the action.

Alternatives to the Action:

As an alternative to the rulemakings described above, the NRC staff considered not taking the action (i.e., the “no-action” alternative). Not adopting a risk-informed special treatment would result in no change in current environmental impacts. However, such an action is not consistent with the Commission’s Policy Statement on the Use of PRA published in 1995 which stated that the use of PRA technology should be increased in all regulatory matters to the extent supported by the state of the art in PRA methods and data, and in a manner that

supports the NRC's traditional defense-in-depth philosophy, nor is it consistent with the Commission's direction provided in SRMs associated with SECY-98-300, SECY-99-256, and SECY-02-0176 which :

(1) directed the staff to evaluate strategies to make the scope of the nuclear power reactor regulations that impose special treatment risk-informed (SRM for SECY-98-300),

(2) approved publication of the ANPR and the rulemaking plan for developing a proposed rule for risk-informing special treatment requirements (SRM for SECY-99-256),

(3) directed the staff to issue proposed § 50.69 for public comment.

Alternative Use of Resources:

This action does not involve the use of any resources not previously considered by the NRC in its past environmental statements for issuance of operating licenses for power reactors.

Agencies and Persons Consulted:

The NRC staff developed the final rule and this environmental assessment. In accordance with its stated policy, the NRC staff provided a copy of the final rule to designated liaison officials for each state. No other agencies were consulted. The NRC staff previously provided a copy of this environmental assessment to the state liaison officials as part of the issuance of the proposed rule for public comment and no comments on the environmental assessment were received.

FINDING OF NO SIGNIFICANT IMPACT

On the basis of the environmental assessment, the NRC concludes that the action will not have a significant effect on the quality of the human environment. Accordingly, the NRC has determined not to prepare an environmental impact statement for the action.

Documents may be examined and/or copied for a fee, at the NRC's Public Document Room, located at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available records will be accessible electronically from the Agencywide Documents Access and Management System (ADAMS) Public Library component of the NRC web site http://www.nrc.gov (Electronic Reading Room).

Dated at Rockville, Maryland, this th day of , 2004.

FOR THE NUCLEAR REGULATORY COMMISSION

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